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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,383	06/09/2006	Sjoerd Stallinga	NL031441	3884

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BRIARCLIFF MANOR, NY 10510

EXAMINER

WILLIAMS, DON J

ART UNIT	PAPER NUMBER
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2878

MAIL DATE	DELIVERY MODE
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08/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/582,383

Applicant(s)

STALLINGA ET AL.

Examiner

Don Williams

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 16 is/are rejected.
- 7) ☒ Claim(s) 7-15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemori et al (US2003/0142379) in view of Breytman et al (US2004/0118919).

As to claims 1, 16, Takemori et al disclose an optical system (lenses, 5, 6, PJ, 8) for providing a coherent radiation beam (laser beam), a strongly scattering object (diffuser, 7') located in the path of said coherent radiation (laser beam), and a pixelated photo-detector (photosensitive material, 12) for detecting a speckle pattern incident thereon, the speckle pattern being produced by coherent radiation (laser beam) being incident on strongly scattering object (diffuser, 7'), wherein the size of the pixels of photo-detector (photosensitive material, 12) is determined by the location thereof in an optical apparatus relative to strongly scattering object (diffuser, 7') as determined by $(\lambda/NA, 11)$ where λ is the wavelength of the coherent radiation (laser beam), and NA (11) is the numerical aperture of optical system, (fig. 3, paragraphs [0051], [0079], [0081], [0085]). Takemori et al fail to explicitly disclose bright and dark patches present in speckle pattern. Breytman et al disclose that laser light illuminating a rough surface causes interference within the scattered light. Breytman et al also disclose the speckle

effect produces a speckle pattern having bright and dark regions as a result of the light interference, (fig. 4a, paragraph [0051]). It would have been obvious for one of ordinary skill in the art to modify Takemori et al in view of Breytman et al to include a speckle pattern having bright and dark regions in order to determine the size of the pixels resulting in the change of spatial distribution frequency of the speckles.

As to claim 2, Takemori et al disclose a coherent radiation source (1) for providing a coherent radiation beam (laser beam) of radius, photo-detector (12) being located a distance z (L) from strongly scattering object (7'), (fig. 3). Takemori et al in view of Breytman et al fail to explicitly disclose radius (a) and $NA=a/z$. Takemori et al does disclose numerical aperture (NA), focal length (f_2) and wavelength λ , (paragraph [0056], [0058], [0060]). It would have been obvious for one of ordinary skill in the art to modify Takemori et al in view of Breytman et al to use aperture (NA), focal length (f_2) and wavelength λ in order to manipulate the spectral distribution of light to determine the size of the bright and dark patches resulting in the beam radius.

As to claim 3, Takemori et al disclose a coherent radiation source (1) for providing a coherent radiation beam (laser beam), and one or more converging optical elements (7, PJ, 8) having a focal length (f_2), in the path of the coherent radiation beam (laser beam) between strongly scattering object (7') and photo-detector (12), (Fig. 3, paragraphs [0079], [0081], [0085]). Takemori et al in view of Breytman et al fail to explicitly disclose radius (a) and $NA=a/f$. Takemori et al does disclose numerical aperture (NA), focal length (f_2) and wavelength λ , (paragraph [0056], [0058], [0060]). It would have been obvious for one of ordinary skill in the art to modify Takemori et al in

view of Breymann et al to use aperture (NA), focal length (f_2) and wavelength λ in order to manipulate the spectral distribution of light to determine the size of the bright and dark patches resulting in the beam radius.

As to claim 4, Takemori et al disclose one or more optical elements (8, 12) are located a distance (L) from the strongly scattering object (7') and a distance (f_2) from the photo-detector (12), wherein $1/v + 1/b = 1/f$ ($1/L + 1/f_2 = 1/f_1$), (Fig. 3, paragraphs [0079], [0081], [0085], Fig. 5, paragraphs [0093] [0096]).

As to claim 5, Takemori et al disclose a spatial light modulator (7) is provided between the coherent radiation source (1) and the strongly scattering object (7'), (fig. 3, paragraph [0079]).

As to claim 6, Takemori et al disclose one or more elements (5, 6, PJ) with optical power is provided in the radiation path between the coherent radiation source (1) and the strongly scattering object (7), (fig. 3, paragraph [0079]).

Allowable Subject Matter

Claims 7-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach either singly or in combination an optical apparatus having a physically unclonable function and η_{\max} in the range of 1 to 20 and η_{\min} in the range of 0 to 0.5.

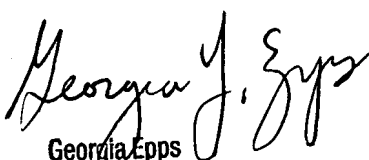
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Don Williams whose telephone number is 571-272-8538. The examiner can normally be reached on 8:30a.m. to 5:30p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 2878


Georgia Epps
Supervisory Patent Examiner
Technology Center 2800